

CAYONGNBAOS
81R65

G THE TOWNSHIP OF **LANBROOK**




1981 ROAD

NEEDS STUDY

Technical Co-ordinating Committee

D. W. Weylie	Mayor (Chairman)
R. Johnston	Councillor
H. Brown	Councillor
C. Switzer	Clerk
R. Ferguson	Road Superintendent
H. Patterson	Hamilton-Wentworth Region
G. Freeman	Representative, Ministry of Transportation and Communications
B. Nemethy	Representative, Ministry of Transportation and Communications
McCormick, Rankin & Associates Limited	Consultant to the Committee



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Chapter 1

Introduction

PURPOSE

The purpose of undertaking a Road Needs Study is to provide the Ministry with sufficient information to develop a subsidy allocation program based on the condition of the existing road system. This information is obtained through the process of:

1. Ascertaining the municipality's present road system for inventory purposes,
2. Inventorying those roads, structures and railway crossings making up the road system,
3. Identifying any deficiencies, estimating the cost of removing those deficiencies and providing the municipality with a system which will assist them in scheduling road improvements,
4. Examining the municipality's maintenance recording system and provide them with a financial summary of their road department's maintenance costs.

BACKGROUND

Early in 1975, the Ministry of Transportation and Communications initiated a program which is aimed at the development of a system to distribute available provincial funds to the larger spending, lower tier municipalities. A system similar to this has been operating successfully for a number of years with the Counties and Regions. The program is based on a consistent method of measuring construction needs and evaluating maintenance operation expenditures. It was felt that such a system was necessary, as provincial funds for road subsidies to municipalities are limited and in recent years municipal requests for these funds have been exceeding the Ministry's Municipal Road Budget.

STUDY METHODS

The procedures used to carry out this study are explained in detail in the following manuals published by the Ministry of Transportation and Communications:

- (a) Methods Manual
Municipal Road Systems
Needs Measurements 1978
- (b) Inventory Manual
Municipal Roads and Structures 1978

These manuals are available in the Township offices for further inspection of the Study Methods.

Basically, the study was divided into the following categories:

- (1) Traffic - determine present and estimate 10 year traffic volumes,
- (2) Inventory of the existing road system along with related structures and railway crossings,
- (3) Estimation of Construction Needs,
- (4) Examination of Past Maintenance Costs,
- (5) Review of Equipment Inventory and Needs, and
- (6) Preparation of a report.

A discussion of the first five categories is included in the ensuing chapters.

Chapter 2

Traffic

GENERAL

A good measure of the relative importance of any particular road section, within the overall system is the number of vehicles using that road daily. Using these traffic volumes, it is possible to compare the existing condition of a road with the appropriate minimum tolerable standard set by the Ministry of Transportation and Communications for the various design classes.

A total of 45 automatic traffic counts were taken by the Region for the Township during the week of June 18 to June 25. Of the 45 counts, 42 were 24 hour counts with the remaining being 3 day counts over a weekend. These 3 day counts were taken in the vicinity of the Binbrook Conservation Area. A 10 year traffic growth factor of 1.25 was agreed to by the Committee for study purposes. This growth factor was developed by taking into consideration the 10 year growth factors being used by the Region and the adjacent municipalities. For the roads that will be serving the proposed industrial park (Glover and Twenty Roads) 10 year traffic volumes were developed based on the proposed development.

The traffic data map, Map 1, page 4 indicates the 1981 and estimated 1991 A.A.D.T., (Average Annual Daily Traffic), on the Township road in the area where the traffic count was taken. This information was used during the inventory to determine the appropriate appraisal standards for each road section, structure and railway crossing.

TRAFFIC DATA MAP

LEGEND

COUNT LOCATION & NUMBER
1981 A A D T
1991 A A D T

ABERDEEN COUNTY LOCATION

B

ABERDEEN

UPPER TOWN

MAP 1, PAGE 4

Township of
GLANBROOK



Chapter 3

Road System

GENERAL

The road system construction needs indicate the total dollar expenditure required to improve that portion of the existing road system which did not meet the Ministry's minimum tolerable standards. These construction needs are determined by an inventory which indicates:

- (1) the type and location of all deficiencies,
- (2) the time periods in which the deficiencies are expected to occur, and
- (3) an estimate of the cost required to eliminate the deficiencies based on the Township's desirable standards.

INVENTORY

An inventory was taken of all roads, structures and railway crossings presently under the jurisdiction of the Township. The Ministry's new manual indicates that all rural roads and major urban roads are to be inventoried in detail. The remaining semi-urban sections are to be inventoried using the modified appraisal method which only records certain features of the existing road such as the road section's name and location, the length of the section, the existing class, the structural rating, and an indication of the type, cost and time of any improvements necessary. The number of road sections was kept to a minimum with consideration to physical characteristics and conditions of the roads.

The resulting road inventory sections are shown on Map 2, page 7. Similarly, the structure and railway crossing locations are shown on Map 3, page 8.

A summary of the road system in kilometres by surface type was recorded from the statistical data recorded during the road inventory. This summary, page 6, indicates a total of 166.4 km of road are presently under the Township's jurisdiction. Included in this overall total are 31.1 km of Boundary Roads.

ROAD SYSTEM IN KILOMETRES 1981

SURFACE TYPE	LENGTH IN KILOMETRES
EARTH	1.0
GRAVEL - STONE	73.3
LOW CLASS BITUMINOUS	90.1
INTERMEDIATE CLASS BITUMINOUS	1.0
HIGH CLASS BITUMINOUS	1.0
CONCRETE	—
ASPHALT ON CONCRETE	—
OTHER	—
NEW ROAD	—
SUB - TOTAL	166.4
LESS ADJACENT MUNICIPALITY'S SHARE OF BDY. ROADS $31.1 \div 2 = 15.5$	15.5
TOTAL	150.9



ROAD SECTION MAP

LEGEND

ROAD SECTION



MAP 2, PAGE 7

STRUCTURE & RAILWAY CROSSING LOCATION MAP

LEGEND

STRUCTURES
RAILWAY CROSSINGS



AREA



AREA

MAP 3, PAGE 8

Township of
GLANBROOK

Chapter 4

Construction Needs

DEFICIENCIES

Road Sections

All road sections that are classified as being inadequate are deficient for one or more of the following reasons:

- (1) Surface Type - substandard surface type dependent upon traffic volume or road classification.
- (2) Surface Width - inadequate width of driving surface excluding shoulders, depending on traffic volume or road classification.
- (3) Average Safe Speed - inability to maintain a reasonably safe speed.
- (4) Level of Service - inability of the road to accommodate the traffic.
- (5) Structural Adequacy - inability of the road base to support vehicles.
- (6) Drainage - where road sections experience flooding at least once per year.

Note: Items 1 to 6 inclusive apply to roads inventoried in detail. Only items 1, 5 and 6 apply to roads inventoried with the modified appraisal.

Structures

Bridges (i.e. those structures of 6.0 m span and greater), may be classified as being inadequate if they are deficient for one or more of the following reasons:

- (1) Safe Loading - inability to carry loads of at least 10 tonnes.
- (2) Roadway Width - inadequate width of driving surface on the structure.
- (3) Vertical Clearance - inadequate height from road to overhead obstruction.
- (4) Level of Service - inability of the structure to accommodate traffic.
- (5) Sidewalks - inadequate provision made for pedestrian traffic in urban areas.
- (6) Opening Adequacy - inadequacy of the span to accommodate normal water flow or traffic in the case of grade separations.

Railway Crossings

Railway crossings are classified as being deficient for one or more of the following reasons:

- (1) Visibility - insufficient train to vehicular sight distance at level crossing.
- (2) Exposure Index - the exposure index, defined as being the product of the number of trains per day and the A.A.D.T. (Average Annual Daily Traffic), exceeds the limits specified in the inventory manual for the existing protection. These limits are as follows:

Exposure Index	Type of Protection
0 - 3,500	Advance Warning Signs
3,500 - 75,000	Automatic Signals
75,000 + rural	Grade Separate (where possible)
150,000 + urban	Grade Separate (where possible)

A complete listing of all railway crossings is included in the appendix of this report.

TYPE OF IMPROVEMENTS

As stated in the inventory manual, only three types of improvements have been costed for the deficient roads and structures. These improvements are:

- (1) Spot - improvements to roads which eliminate isolated deficiencies.
- (2) Tolerable - nominal base or widening improvements for deficient rural roads carrying less than 200 vehicles per day.
- (3) Design - improvements of roads to the municipality's standard.

Maps have been included at the end of this chapter showing the location of the road sections, structures and railway crossings and the construction requirements for the Township's existing road network.

TIME AND COST OF IMPROVEMENTS

Using 1979 unit prices and typical cross sections approved by the Technical Co-ordinating Committee, "Bench Mark Construction Costs" were calculated. These costs, included in the Appendix of this report, were used to determine the Township's total theoretical needs which are summarized on pages B.1-3.

These needs are divided into the Now, 1-5 and the 6-10 Year periods. The time period that a deficient road falls into is determined by the criteria outlined in the inventory manual and based on the condition of the facility at the time of the appraisal. The Now period being a backlog of construction needs for deficient roads and the 1-5 and 6-10 Year periods being ranges in which future deficiencies are expected to occur.

For the ten year study period the Township's needs are estimated to be \$6,073,000.00. Based on existing Ministry subsidy arrangements, the Township's share of the local road construction needs is approximately \$3,037,000.00.

MUNICIPAL ASSISTANCE PROGRAM

From the foregoing and the results from Road Needs Studies in other municipalities, the Ministry of Transportation and Communications has sufficient information available which has permitted the introduction of an allocation program based on "Needs" and "Available Funds".

PRIORITY RATINGS AND PRIORITY GUIDE NUMBERS

Priority Rating

The Ministry of Transportation and Communications has developed a mathematical empirical formula which attaches a priority to each deficient road section or structure. The Priority Rating is based on both condition and usage of the facility. The larger the Priority Rating number, the greater the need for improvement. Priority Ratings, however, do not take into consideration the cost of improvement and as a result it is desirable to calculate a Priority Guide number.

Priority Guide

The Priority Guide number takes into consideration the condition of the road, the traffic using the facility during the study period and the estimated cost to remove the deficiency. This is accomplished by using the formula

$$\text{Priority Guide} = \frac{100 \text{ Minus Condition Rating}}{\text{Total cost/vehicle miles of travel*}}$$

$$= \frac{100 \text{ Minus Condition Rating}}{\text{Cost/vehicle mile}}$$

$$\begin{aligned} \text{*Vehicle miles of travel} &= \text{section length x average daily} \\ &\quad \text{study period traffic x 365 days} \\ &\quad \text{in a year x estimated years of} \\ &\quad \text{life of reconstructed facility} \end{aligned}$$

The larger the Priority Guide number, the greater is the cost benefit of improvement. Consequently, if improvements are made to two similar sections with the same Priority Rating number but different Priority Guide numbers, the greatest benefit, for the dollar expended, will be realized by the section with the higher Priority Guide.

A priority for all other deficient roads has been developed using "100 minus the Condition Rating". As with the Priority Rating and the Priority Guide Number, the larger the number, the greater the need.

In order to assist the Township in making preliminary selections of future construction programs, a complete listing of all deficient road sections by road classification, time periods, and priority has been included in the Appendix of this report.

AS THE NEEDS SUMMARIZED HEREIN DO NOT TAKE INTO CONSIDERATION SUCH FACTORS AS PROJECT CONTINUITY, ENVIRONMENTAL IMPACT, DISTRIBUTION OF WORK WITHIN THE MUNICIPALITY, AVAILABILITY OF CONSTRUCTION FUNDS, ETC., THE TOWNSHIP'S ACTUAL RECONSTRUCTION PROGRAM MAY DIFFER FROM THE FINDINGS OF THIS REPORT.

COST SHARING OF TOTAL CONSTRUCTION NEEDS
(THOUSANDS OF DOLLARS)
(AS OF JAN. 1, 1981)

TIME PERIODS	NOW			1 - 5 YEARS			NOW + 1-5 YEARS			6-10 YEARS			NOW + 1-10 YEARS		
	MUN'S SHARE	M.T.C.'S SHARE	TOTAL	MUN'S SHARE	M.T.C.'S SHARE	TOTAL	MUN'S SHARE	M.T.C.'S SHARE	TOTAL	MUN'S SHARE	M.T.C.'S SHARE	TOTAL	MUN'S SHARE	M.T.C.'S SHARE	TOTAL
• RURAL	225	225	450	1227	1227	2454	1452	1452	2904	1365	1366	2731	4269	4270	8539
• SEMI-URBAN	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
• SPOT IMPROVEMENTS															
- RURAL	162	161	323	—	—	—	162	161	323	—	—	—	162	161	323
- SEMI-URBAN	40	39	79	—	—	—	40	39	79	—	—	—	40	39	79
• BRIDGES	14	15	29	—	—	—	14	15	29	—	—	—	14	15	29
• RAILWAY CROSSINGS	10	9	19	—	—	—	10	9	19	—	—	—	10	9	19
TOTAL	450	450	900	1227	1227	2454	1677	1677	3354	1365	1366	2731	3042	3043	6085

CONSTRUCTION REQUIREMENTS MAP

LEGEND

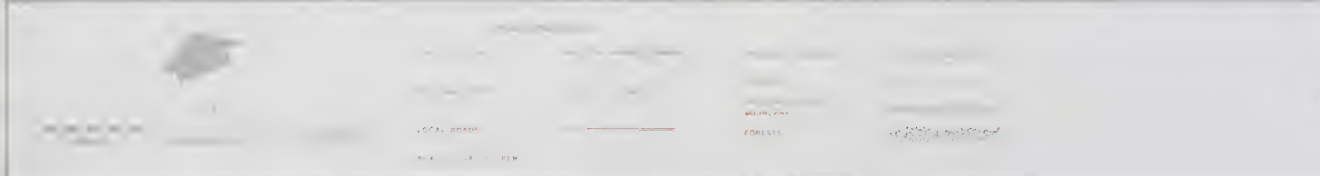
NOW DEFICIENT	25
1.5% DEFICIENT	-----	20
2.0% DEFICIENT	-----	27



MAP 4, PAGE 14



Township of GLANBROOK



Chapter 5

Fixed Costs

MAINTENANCE

Maintenance expenditures for 1979 and 1980 were reviewed and have been summarized on page 15 in accordance with the Ministry's form MRA 36. The total subsidizable maintenance expenditures, including overhead was \$386,061.00 in 1979 and \$499,124.00 in 1980.

EQUIPMENT REPLACEMENT COSTS

A list of the major pieces of equipment operated by the Township's Road Department was prepared and is shown on page 16. This "Equipment Inventory and Theoretical Needs" table describes each piece of equipment and gives the approximate cost (based on 1981 unit prices) and the replacement year for each. This table indicates a theoretical schedule with the actual equipment replacement being determined each year by council.

MAINTENANCE EXPENDITURES

CATEGORIES & ACTIVITIES		1979	1980	1981	1982	1983	1984	1985
BRIDGES & CULVERTS								
A	Bridges & Culverts	4851	5482					
ROADSIDE MAINTENANCE								
B-1	Grass Mowing & Weed Spraying	9278	7198					
B-2	Brushing ,Tree Trimming & Removal	8270	23220					
B-3	Ditching	23550	19950					
B-4	Catch Basins , Curb & Gutter Cleaning Storm Sewers	17720	25891					
B-5	Debris & Litter Pick-up	2218	4628					
B	Total Roadside Maintenance	61036	80887					
HARD TOP MAINTENANCE								
C-1	Patching & Spray Patching	28792	35468					
C-2	Sweeping , Flushing , Cleaning	178	2227					
C-3	Shoulder Maintenance - Grading Patching , Washouts , Dust Layer	2280	496					
C-4	Resurfacing	62943	91060					
C	Total Hard Top Maintenance	94193	129251					
LOOSE TOP MAINTENANCE								
D-1	Patching & Washouts	311	363					
D-2	Grading & Scarifying	15718	14322					
D-3	Dust Layer	21124	27248					
D-4	Prime or Priming	47938	60451					
D-5	Gravel Resurfacing	71648	115526					
D	Total Loose Top Maintenance	156739	217910					
WINTER CONTROL								
E-1	Snow Plowing & Removal	26225	15087					
E-2	Sanding & Salting	29698	32318					
E-3	Snow Fence , Culvert Thawing Etc.	2984	4237					
E-4	Winter Standby	—	—					
E	Total Winter Control	58907	51642					
SAFETY DEVICES								
F	Safety Devices , Signs , Guide Rails, Railroad Maintenance	10335	13952					
MISCELLANEOUS								
G	Total Miscellaneous							
TOTAL		386061	499124					

EQUIPMENT INVENTORY AND NEEDS
(BASED ON MARCH 1981 COSTS)

ITEM	MACHINE NUMBER	YEAR PURCHASED	TENTATIVE REPLACEMENT & COST (In Thousands of Dollars)											
			1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	
Chev. Pickup Cust. Del. 10	501	1978	-	-	-	8	-	-	-	-	-	-	-	
Int. R200 2050A	502	1978	-	-	-	-	-	50	-	-	-	-	-	
Dodge D800	503	1974	-	50	-	-	-	-	-	-	-	-	-	
John Deere 770 Grader JD 770	504	1976	-	-	-	-	-	-	-	-	120	-	-	
Case Backhoe 680E	505	1976	-	-	-	-	-	-	-	-	-	50	-	
Dodge D800	506	1971	NOT TO BE REPLACED											
John Deere 310 Tract & Mower	507	1973	-	-	-	-	-	-	-	16	-	-	-	
Dodge Van Sportsman	508	1966	-	-	10	-	-	-	-	-	-	-	-	
Int. S. Series DT 466	509	1980	-	-	-	-	-	-	50	-	-	-	-	
John Deere 310 A	512	1981	24	-	-	-	-	-	-	-	-	-	-	
Distributor TB1307	514	1956	BEYOND STUDY											
Int. S. Series DT 466	516	1976	48	-	-	-	-	-	-	-	-	-	-	
Int. 1020 2010 A	518	1976	-	-	-	-	50	-	-	-	-	-	-	
Dominion Grader D562	519	1970	-	-	120	-	-	-	-	-	-	-	-	
Buffalo Spring Roller KT19A8	520	----	BEYOND STUDY											
Miscellaneous			3	3	3	3	3	3	3	3	3	3	3	
TOTAL			75	53	133	11	53	53	53	19	123	53	3	

Chapter 6

Annual Update

It is desirable that this study be kept current by the municipality. This is accomplished by undertaking an annual review under the following headings:

- (1) Construction - elimination of the construction needs for those sections where improvements have been undertaken since the last review.
- (2) Structural Adequacy - check for any structural failures that have occurred.
- (3) Maintenance - make adjustments for any changes in maintenance practices or exceptional cost increases.
- (4) Structures - review bridges for structural deterioration.
- (5) System Changes - revise deficiency listings and update inventory sheets as changes in the Road System take place.

Updating procedures are detailed in the Methods Manual "Municipal Road Systems, Needs Measurements". Additional information or clarification can be obtained from the Ministry of Transportation and Communications.

Appendices

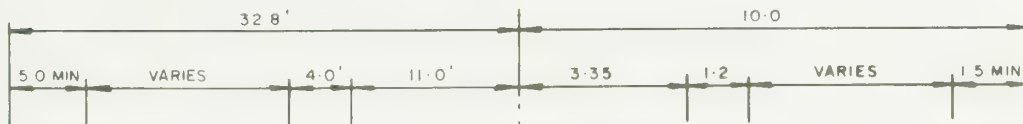
Appendix A

Geometric Standards

GEOMETRIC STANDARDS

IMPERIAL

METRIC



0 - 400 V.P.D. RURAL

GRAVEL SURFACE

4" GRANULAR 'A', 6" GRANULAR 'B'

101 mm GRANULAR 'A', 152 mm GRANULAR 'B'

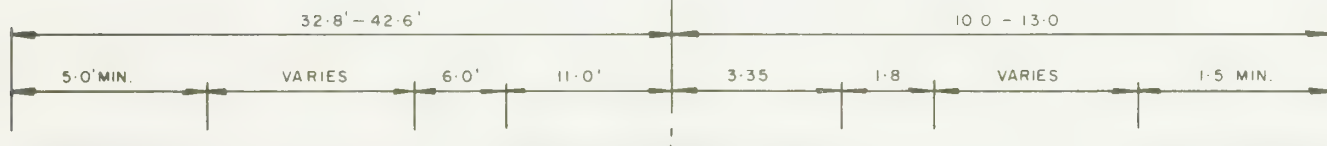


400 - 1000 V.P.D. RURAL

DOUBLE SURFACE TREATMENT

6" GRANULAR 'A', 10" GRANULAR 'B'

152 mm GRANULAR 'A', 254 mm GRANULAR 'B'



1000 - 3000 V.P.D. RURAL

BITUMINOUS PAVEMENT

2" HOT MIX FOR 1000 - 2000, 2.5" HOT MIX FOR 2000 - 3000
6" GRANULAR 'A', 12" GRANULAR 'B'

51 mm HOT MIX FOR 1000 - 2000, 63 mm HOT MIX 2000 - 3000
152 mm GRANULAR 'A', 305 mm GRANULAR 'B'



3000 + V.P.D. RURAL

BITUMINOUS PAVEMENT

3" HOT MIX, 6" GRANULAR 'A', 12" GRANULAR 'B'

76 mm HOT MIX, 152 mm GRANULAR 'A', 305 mm GRANULAR 'B'

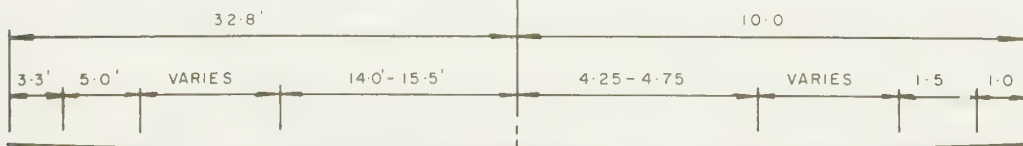


SEMI - URBAN

BITUMINOUS PAVEMENT

3" HOT MIX, 6" GRANULAR 'A', 12" GRANULAR 'B'

76 mm HOT MIX, 152 mm GRANULAR 'A', 305 mm GRANULAR 'B'



URBAN LOCAL RESIDENTIAL

BITUMINOUS PAVEMENT

3" HOT MIX, 6" GRANULAR 'A', 12" GRANULAR 'B'

76 mm HOT MIX, 152 mm GRANULAR 'A', 305 mm GRANULAR 'B'

Appendix B

Bench Mark Costs

URBAN ROAD CONSTRUCTION

(COST IN THOUSANDS OF DOLLARS PER KILOMETRE)

ARTERIAL

Nº OF LANES	BASE & SURF. (MINOR)	BASE & SURF. (MAJOR)	RESURF. & WIDEN (MINOR)	RESURF. & WIDEN (MAJOR)	RECONST. SEMI-URB. ST'D	RECONST. URB. ST'D NOMIN. S.S.*	RECONST. URB. ST'D INCLUD. S.S.	ST. SEWER & ROAD REINSTAT.
2								
3								
4								
5								
6								
7								

COLLECTOR

Nº OF LANES		BASE & SURF. (MINOR)	BASE & SURF. (MAJOR)	RESURF. & WIDEN (MINOR)	RESURF. & WIDEN (MAJOR)	RECONST. SEMI-URB. ST'D	RECONST. URB. ST'D NOMIN. S.S.*	RECONST. URB. ST'D INCLUD. S.S.	ST. SEWER CONST. & RD. REINSTAT.
2	R.								
	I.C.								
3	R.								
	I.C.								
4	R.								
	I.C.								

LOCAL

Nº OF LANES		BASE & SURF. (MINOR)	BASE & SURF. (MAJOR)	RESURF. & WIDEN (MINOR)	RESURF. & WIDEN (MAJOR)	RECONST. SEMI-URB. ST'D	RECONST. URB. ST'D NOMIN. S.S.*	RECONST. URB. ST'D INCLUD. S.S.	S.S. CONST. & ROAD REINSTAT.
2	R.	41	107			190	233	372	178
	I.C.		128				280	401	180

* NOMINAL STORM SEWER COSTS INCLUDE :

- REPLACEMENT OR RELOCATION OF MANHOLES AND CATCH BASINS AS REQUIRED
- EXTENSION OF LATERALS
- ADJUSTMENTS TO MANHOLE AND CATCH BASIN COVERS.

RURAL ROAD CONSTRUCTION (Cost in thousands of dollars per kilometre)

Contract Prices

	Design Year AADT	Type of Construction	Average Cost Per Kilometre		
			Flat	Rolling	Rocky
DESIGN STANDARD	Min. Tol.	Base & Surface (Grav. Only)	35	40	
		Resurf. & Widen (Grav. Only)	29	34	
	200 - 400	Base & Surface	46	51	
		Resurf. & Widen	42	47	
		Reconstruction	96	105	
	400 - 1000	Base & Surface	55	60	
		Resurf. & Widen	45	50	
		Reconstruction	109	129	
	1000 - 3000	Base & Surface	80	85	
		Resurf. & Widen	55	65	
		Reconstruction	158	180	
	Over 3000 2 Lanes	Base & Surface			
		Resurf. & Widen			
		Reconstruction			
	4 Lanes	Base & Surface			
		Major Resurf. & Widen			
		Reconstruction			

NEW STRUCTURES (AVERAGE COST PER SQUARE METRE OF DECK AREA)

Proposed Structure	Soil Conditions		
	Good	Fair	Poor
Single Span	670 / 570	700 / 600	800 / 700
Multi Span	615 / 450	665 / 500	755 / 590

WITH/WITHOUT
EPOXY COATED STEEL

RESURFACING (Cost in Thousands of Dollars Per Kilometre)

RURAL

Road Width in Metres	Upper Tier Only			Double Lift Hot Mix*
	Single Surf. Treatment	Double Surf. Treatment	Single Lift Hot Mix*	
5.5 - 6.0				
6.1 - 6.5				
6.6 - 7.0		8.0	22.0	40.0
10.0 - 11.0				
13.0 - 15.0				

* Includes Shouldering

URBAN

Road Width in Metres(Lanes)	Upper Tier Only Single Lift Hot Mix**	Double Lift Hot Mix**
6.0 - 7.0 (2 ln)	24.0	41.0
7.1 - 9.0 (2 ln)	28.0	49.0
10.0 - 12.0(3 ln)		
13.0 - 15.0(4 ln)		
19.0 (5 ln)		
22.0 (6 ln)		
26.0 (7 ln)		

** Cost Includes Catch Basin and Manhole Adjustments and up to 15% Padding

UNIT PRICE COSTS

Granular "A" /tonne	<u>4.35</u>	Catch Basin (Each)	<u>800.00</u>
Granular "B" or "C"/tonne	<u>4.35</u>	Manhole (Each)	<u>1,600.00</u>
Hot Mix /tonne (H. L. 4)	<u>26.00</u>	Catch Basin/Manhole Removal (Each)	<u>200.00</u>
Storm Sewer (525 mm Dia.)/metre	<u>112.00</u>	Earth Excavation/Cubic metre	<u>2.90</u>
Curb & Gutter/metre	<u>25.00</u>	Curb & Gutter Removal/metre	<u>5.00</u>
Sidewalk/Square Metre	<u>20.00</u>		

Appendix C

Deficiency Listings

NOW SPOT DEFICIENCIES

ROAD CONSTRUCTION NEEDS BY TIME PERIODS

PRIORITY		TYPE OF DEFICIENCY	SECTION NUMBER	DESCRIPTION			IMPROV. LENGTH (in km.)	TOTAL COST (THOUS)	TYPE OF IMPROV.
RATING	GUIDE			NAME/LOCATION	FROM	TO			
-	-	structural	5	Aldercrest Survey	Con.1, Lot 6	Con.1, Lot 7	2.4	58	B & S
-	-	structural	6	0.5 km East of Hwy.6	Con.2, Lot 7	Con.2, Lot 8	0.2	21	B & S
-	-	structural	21	West-Lincoln Townline Road	Golf Club Rd.	0.6 km South of Golf Club Rd.	0.1	5*	Surface
-	-	structural	24	Hendershott Rd.	Guyatt Rd.	Golf Club Rd.	0.1	5	Replace Culvert
-	-	surface	44	Hall Rd.	Woodburn Rd.	Sinclairville Rd.	0.2	8	B & S
-	-	surface	46	Hall Rd.	Woodburn Rd.	Trimble Rd.	0.3	14	B & S
-	-	surface	65	Miles Rd.	Glanbrook/Haldimand Townline	Chippewa Rd.	0.3	15	B & S
-	-	structural	22	West-Lincoln Townline Road	Binbrook Rd.	Twenty Rd.	-	183*	Carry Over
-	-	surface	31	Guyatt Rd.	Trinity Church	Block 4, Lot 3/ Lot 2	-	20	Carry Over
-	-	surface	71	Harrison Rd.	Hall Rd.	Con.7/Con.8	-	35	Carry Over
-	-	surface	94	Leeming Rd.	Hwy. 6	Ferris Rd.	-	13	Carry Over
-	-	surface	36	Glanbrook/Lincoln Townline	Binbrook Rd.	Kirk Rd.	-	25*	Carry Over
-	-	sight distance	64	Miles Rd.	Chippewa Rd.	Whitechurch Rd.	-	2	Clearing

Reconst. = Complete Reconstruction, B & S = Base & Surface, Resurf. = Resurface, R & W = Resurface & Widen

* Glanbrook Share of Boundary Road Costs

NOW DEFICIENCIES

ROAD CONSTRUCTION NEEDS BY TIME PERIODS

PRIORITY		TYPE OF DEFICIENCY	SECTION NUMBER	DESCRIPTION		IMPROV. LENGTH (in km.)	TOTAL COST (THOUS)	TYPE OF IMPROV.
RATING	GUIDE			NAME / LOCATION	FROM TO			
24	13	structural	25	Hendershott Rd.	Golf Club Rd.	2.1	116	B & S
23	3	structural	96	Ferris Rd.	0.3 km South of Leeming Rd.	1.7	68	B & S
22	21	surface	14	Golf Club Rd.	Trinity Church	1.2	66	B & S
18	7	structural	52	Hall Rd.	Trinity Church	2.2	88	B & S
15	8	surface	12	Dickenson Rd.	Nebo Rd.	0.7	38	B & S
15	5	structural	37	Glanbrook/West-Lincoln Townline	Kirk Rd.	4.2	74*	B & S

Reconst. = Complete Reconstruction, B & S = Base & Surface, Resurf. = Resurface, R & W = Resurface & Widen

* Glanbrook Share of Boundary Road Costs

1 - 5 YEAR DEFICIENCIES

ROAD CONSTRUCTION NEEDS BY TIME PERIODS

PRIORITY		TYPE OF DEFICIENCY	SECTION NUMBER	DESCRIPTION			IMPROV. LENGTH (in km.)	TOTAL COST (THOUS)	TYPE OF IMPROV
RATING	GUIDE			NAME / LOCATION	FROM	TO			
31	7	surface	39	Berry Rd.	Hall Rd.	Bell Rd.	1.3	142	Reconst
29	11	structural	17	Golf Club Rd.	Hendershott Rd.	Woodburn Rd.	2.0	218	Reconst
28	6	structural	72	Kirk Rd. East	Hwy. 56	Trimble Rd.	1.0	129	Reconst
26	5	structural	89	Chippewa Rd.	Glancaster Rd.	Hwy. 6	2.1	332	Reconst
23	14	structural	32	Guyatt Rd.	Block 4, Lot 3/ Lot 2	Hwy. 56	0.6	48	B & S
21	7	structural	20	West-Lincoln Townline Rd.	Golf Club Rd.	Hwy. 20	0.9	71*	Reconst
20	6	structural	33	Guyatt Rd.	Hwy. 56	Hendershott Rd.	2.0	316	Reconst
20	2	structural	9	Glovers Rd.	Glanbrook-Ryckmans Corner Bdy.	0.4 km South	0.4	63	Reconst
19	11	surface	90	Glancaster Rd.	Whitechurch Rd.	Chippewa Rd.	1.3	36*	B & S
18	4	structural	7	Twenty Rd.	Miles Rd.	Nebo Rd.	1.8	206	Reconst
18	4	structural	84	Tisdale Rd.	Chippewa Rd.	Whitechurch Rd.	1.3	125	Reconst
18	3	structural	30	Cemetery Rd.	Fletcher's Rd.	Hwy. 56	2.0	196	Reconst
18	1	surface	8	Twenty Rd.	Glovers Rd.	Nebo Rd.	1.1	202	Reconst
17	2	surface	10	Glovers Rd.	0.4 km North of Twenty Rd.	0.9 km South of Twenty Rd.	1.3	205	Reconst
16	4	structural	13	Dickenson Rd.	Trinity Church	Trinity Church	1.1	120	Reconst
15	3	structural	69	Glanbrook/Haldimand Townline	Blackheath Rd.	Hwy. 56	1.0	48*	Reconst

Reconst. = Complete Reconstruction, B & S = Base & Surface, Resurf. = Resurface, R & W = Resurface & Widen

* Glanbrook Share of Boundary Road Costs

PRIORITY		TYPE OF DEFICIENCY	SECTION NUMBER	DESCRIPTION			IMPROV. LENGTH (in km.)	TOTAL COST (THOUS)	TYPE OF IMPROV.
RATING	GUIDE			NAME/LOCATION	FROM	TO			
22	11	structural	27	Trinity Church Rd.	Golf Club Rd.	North Bdy.	1.5	237	Reconst
21	11	structural	28	Trinity Church Rd.	Golf Club Rd.	Guyatt Rd.	2.2	348	Reconst
18	5	structural	78	Woodburn Rd.	Hall Rd.	Binbrook Rd.	4.6	501	Reconst
17	4	surface	73	Kirk Rd. East	Trimble Rd.	Woodburn Rd.	2.6	283	Reconst
16	5	structural	34	Guyatt Rd.	Hendershott Rd.	Woodburn Rd.	2.0	316	Reconst
14	5	structural	4	Twenty Rd.	Miles Rd.	Hwy. 6	2.7	359	Reconst
12	3	structural	88	Chippewa Rd.	Hwy. 6	Tyneside Rd.	4.0	438	Reconst
11	2	structural	86	Chippewa Rd.	Tyneside Rd.	Trinity Church	2.3	251	Reconst

Reconst. = Complete Reconstruction, B & S = Base & Surface, Resurf. = Resurface, R & W = Resurface & Widen

* Glanbrook Share of Boundary Road Costs

SPOT DEFICIENCIES

STRUCTURE NEEDS BY TIME PERIODS

PRIORITY RATING	STRUCTURE NUMBER	ROAD SECTION NUMBER	DESCRIPTION/LOCATION	IMPROVEMENT	
				COST (THOUS)	TYPE
-	2	96	Ferris Rd., Lot 8/9, Con.7	10	Guide Rail & Approaches
-	3	65	Miles Rd., Lots 10/11, Con.7	11	Replace Wingwall
-	4	74	Trimble Rd., Lots 24/25, Con.7	6	Guide Rail
-	9	37	Glanbrook/West-Lincoln Townline, Lot 33, Con.10	2	Guide Rail

RAILWAY CROSSING INVENTORY - 1981

XING NO.	ROAD SECT. NO.	ROAD DESCRIPTION / LOCATION	NO. OF TRACKS		AVERAGE TRAINS/DAY		NO. OF TRAFFIC LANES	1981 A.A.D.T.	EXPOSURE INDEX	PROTECTION		IMPROVEMENT COST (THOUSANDS)			
			MAIN	SPUR	MAIN	SPUR				EXIST	WARRANT	MUNIC	MTC	OTHERS	TOTAL
1	7	Twenty Rd., Lot 13, Con. 1 & 2	1	-	6	-	2	273	1638	Signs	Signals	3	3	40	46
2	99	Airport Rd., Lot 11, Con. 3 & 4	1	-	6	-	2	750	4500	Signals	Signals	-	-	-	-
3	64	Miles Rd., Con. 6, Lots 10 & 11	1	1	6	-	2	130	780	Signs	Signs	1	1	-	2
4	88	Chippewa Rd.	1	1	6	-	2	364	2184	Signs	Signals	3	3	40	46
5	55	Glanbrook/Haldimand Townline	1	-	6	-	2	160	960	Signs	Signs	-	-	-	-

Appendix D

Sample Inventory Sheets

